



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/519,040

09/21/2005

Catherine Hedouin

RN02084

7039

7590  
RHODIA INC  
CN 7500  
8 CEDAR BROOK DRIVE  
CRANBURY, NJ 08512

05/23/2008

EXAMINER

LIAO, DIANA J

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

05/23/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |   |  |
|------------------------------|--------------------------------------|---|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/519,040 | <b>Applicant(s)</b><br>HEDOUIN, CATHERINE |  |
|                              | <b>Examiner</b><br>DIANA J. LIAO     | <b>Art Unit</b><br>1793                   |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 17-30 and 32 is/are pending in the application.
- 4a) Of the above claim(s) 25-29 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-24 and 30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Acknowledgement of Provisional Election***

1. During a telephone conversation with Kevin McVeigh on 5/15/2008 a provisional election was made to prosecute the invention of group I, claims 17-24, and 30.

Affirmation of this election must be made by applicant in replying to this Office action.

Claims 25-29 and 32 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

### ***Election/Restrictions***

2. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 17-24 and 30, drawn to an oxide composition.

Group II, claim(s) 25-29, drawn to a method of making the oxide composition.

Group III, claim(s) 32, drawn to a method of using the composition.

3. The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The requirements for a special technical feature are outlined in Annex B of Appendix A1 of the MPEP (Administrative Instructions under the PCT, "Unity of Invention"). Unity exists only when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding claimed technical features. The express "special technical features" is defined as meaning those technical

Art Unit: 1793

features that define a contribution which each of the inventions, considered as a whole, makes over the prior art.”(Rule 13.2).

The question of unity of invention has been reconsidered retroactively by the examiner in view of the search performed; a review of WO 95/35152 appears to demonstrate that the claimed species does not define a contribution which each of the inventions, considered as a whole, makes over the prior art. Accordingly, the prior art of the record supports restriction of the claimed subject matter in to the groups as mentioned immediately above.

Groups I-III share a composition made of zirconia, ceria, lanthanum, and another rare earth component, wherein the ration of Zr/Ce is less than 1. WO ‘152 teaches an oxygen storage composition of zirconia and ceria of preferably at least 70% zirconia and up to 30% ceria, and also one or more of lanthana, neodymia, yttria, or mixtures thereof. (page 12, lines 6-15) The common technical feature shared by the groups is not expected to overcome the prior art and thus there is a lack of unity.

4. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

In making the composition, the zirconium sol is obtained by either

- (a) the heat treatment of a zirconium oxychloride
- (b) the action of nitric acid on a hydroxide or carbonate of zirconium

Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include

Art Unit: 1793

all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

5. The claims are deemed to correspond to the species listed above in the following manner:

Species (a), heat and zirconium oxychloride – claim 26

Species (b), nitric acid – claim 27

The following claim(s) are generic: 25.

6. The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons:

Lack of unity of invention may be directly evident “a priori” if before considering the claims in relation to prior art, they do not share a common technical feature. In the case of a species election, it is understood that they share a genus as a common feature. However, the further limitations (species) are imposed in order to make a contribution over prior art. If these species do not share a common technical feature, then they lack unity.

In this case the way in which the zirconium sol is made are different and only share containing zirconium in one of the compounds used. One utilizes heat and zirconium oxychloride as the source of zirconium, and the other utilizes a reaction with nitric acid and zirconium hydroxide or zirconium carbonate as the source zirconium. Therefore, there is a lack of unity.

7. The examiner has required restriction between product and process claims.

Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder.

All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

### ***Priority***

8. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 02/07926 (France), filed on 6/26/2002.

### ***Claim Objections***

9. Claim 31 is not present in the claim listing. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 17-22 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen, et al. (WO 95/35152, WO '152 hereafter) and Wan (US 5,057,483), which was incorporated by reference.

WO '152 teaches an oxygen storage composition comprising a diluted oxygen storage component as part of a layered catalyst. (claim 1) The catalyst is for use as a three-way catalyst, stable at 900°C or more. (page 10, lines 30-33) The oxygen storage composition of the second layer of the catalyst taught in WO '152 is considered to be the claimed composition, as will be discussed. An example “second oxygen storage component”, as described in WO '152 as part of a larger catalyst composition, is a co-precipitated ceria/zirconia composite which has preferably up to 30 weight % ceria, and at least 70 weight % zirconia. The oxygen storage composition also may comprise one or more of lanthana, neodymia, yttria, or mixtures thereof in addition to ceria. (page 12, lines 1-12) This fairly teaches, with sufficient specificity, the use of lanthana in combination with neodymia. Wan '483 is incorporated by reference into WO '152. (page 21, lines 14-15).

Wan '483 teaches that zirconium particles are stabilized by one or more rare earth oxides, such as cerium dioxide. (col 8, lines 39-43) Unstabilized zirconia will undergo phase transition at high temperatures, leading to a loss in surface area. However, the stabilized support can enter high temperatures without significant thermal degradation. (col 8, lines 50-57) Wan '483 discloses that a ceria-stabilized zirconia powder of 12% by weight ceria has a surface area of 55 m<sup>2</sup>/g. (col 12, lines 26-28)

WO '152 teaches the compositional limitations of the instant claims. Although a single oxygen storage composition is not disclosed containing only zirconium, cerium, lanthanum, and neodymium oxides, such a composition can be at once envisaged with the description of a composition which contains zirconia, ceria, and preferably one or more of lanthana, neodymia, yttria, or mixtures thereof in addition to ceria, as taught by WO '152. There are only six combinations of rare earths other than ceria, leading to the combination of the instant claims to be fairly taught. Regardless of the composition of the oxygen storage component, the total example composition taught in WO '152 does comprise of zirconium and cerium oxide, with a ratio of Zr/Ce >1 and lanthanum and neodymium oxide to satisfy instant claim 17.

The limitations regarding the surface area after calcination at a certain temperature for 6 hours are not found to be patentable as part of these composition claims. The properties recited in the instant claims require that the composition is used and undergoes a process and then has the surface area properties. It appears that the claimed composition and that taught in the prior art are substantially identical and thus these other properties must be inherent. The teachings of Wan '483 suggest that the



zirconia is stabilized and thus should be able to retain high surface area, even at high temperatures.

Therefore, claims 17-22 and 30 are not found patentable over the prior art.

### ***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. Claims 17-24 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen, et al. (WO '152) and Wan '483, which was incorporated by reference.

The teachings of WO '152 and Wan '483 are as discussed above. In addition, the example process to make the product of WO '152 makes no mention of any sulfur containing ingredient. (pages 34-35) WO '152 also teaches that a preferred oxygen storage composition contains 60-90% zirconia, 10-30% ceria, and when used, 0.1-10%

a rare earth component selected from lanthana, neodymia, and yttria. (page 21, lines 16-21)

WO '152 is silent to the sulfur content of its composition, and suggests overlapping ranges for but does not specifically teach, the claimed ranges of oxides. WO '152 also does not specifically disclose the ranges for the surface area of the compositions after several varying calcination conditions.

Regarding the sulfur content, since WO '152 does not teach or state anything to suggest that there is sulfur in its oxygen storage composition. Sulfur would be an impurity, and it would be obvious to one of ordinary skill in the art to achieve as pure a product as possible.

Regarding the oxide composition, WO '152 teaches ranges which meet the limitations for zirconium and cerium oxides but does not teach specific weight percentages for lanthanum or neodymium oxides. However, the guidance of the weight percentages in general, one finds that no more than 30% of the oxide composition by weight should be made up of non-ceria rare earth metal oxides. The further teachings of WO '152 state that preferably the rare earth component selected from lanthana, neodymia, and yttria should not exceed 10%. This would suggest that the total amount of rare earth oxides should not exceed 10% since La, Nd, and Y are stated to be equivalents of one another. However the range is considered, the amount of lanthanum oxide and neodymium oxide taught in WO '152 overlaps with that of the claimed ranges and thus there is a *prima facie* case of obviousness.

Regarding surface areas, the claimed limitations are not given patentable weight for the reasons discussed above. Alternatively, it would be obvious to create a stable compound at high temperature of the composition taught in WO '152 because it is used at high temperatures, such as those of 900°C or more. (page 10, lines 30-31) It would be obvious to one of ordinary skill in the art to create a material, well stabilized by rare earth oxides as taught in Wan '483, which does not undergo phase transition at a temperature anywhere close to that of operating temperature. Since the starting surface areas of the zirconia composite taught in Wan '483 are equal to or above the surface areas as recited in the instant claims, it would have been obvious that a properly stabilized composition would have the same surface area after any calcinations. A higher surface area would be desired in order further disperse catalyst onto the composition, as rhodium is dispersed in Wan '483 (col 8, lines 38-39). In addition, it would be desirable for the composition to be thermally stable, and the retention of surface area is a correlating result. Therefore, the claimed surface areas after calcination is not found patentable over the prior art.

Due to overlapping ranges and other suggested teachings about surface area, claims 17-24 and 30 are not found patentable over the prior art.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yoshikawa (US 2002/0107141) and Wu, et al. (US 6,248,688).

Claims 17-24 and 30 have been rejected. No claims have been allowed. Claims 25-29 and 32 have been withdrawn.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIANA J. LIAO whose telephone number is (571)270-3592. The examiner can normally be reached on Monday - Friday 8:00am to 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngoc-Yen M. Nguyen/  
Primary Examiner, Art Unit 1793

Application/Control Number: 10/519,040  
Art Unit: 1793

Page 12

DJL